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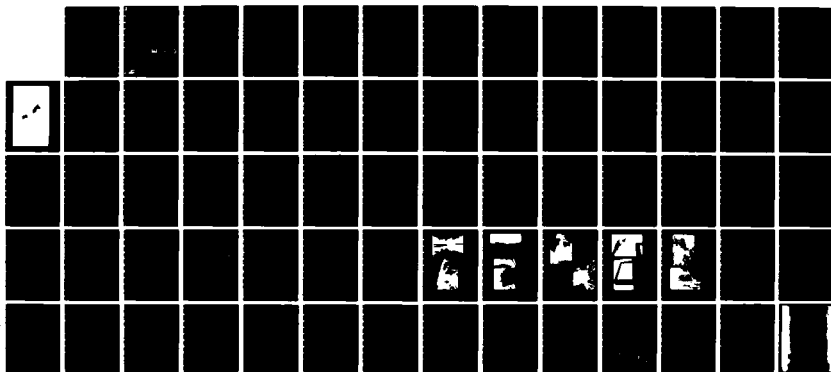
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
BURR POND DAM (CT 000. (U) CORPS OF ENGINEERS WALTHAM  
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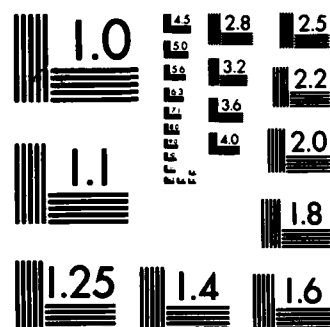
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FARMINGTON RIVER BASIN  
TORRINGTON, CONNECTICUT

BURR POND DAM  
CT 00099

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS. 02154

JUNE 1980

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER  CT 00099	2. GOVT ACCESSION NO.  AD A142-85	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Farmington River Basin Torrington, Conn., Burr Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED  INSPECTION REPORT
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)  U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT PROJECT TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE  June 1980
		13. NUMBER OF PAGES  50
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)  UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  DAMS, INSPECTION, DAM SAFETY,  Farmington River Basin Torrington, Conn. Burr Pond Dam		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Burr Pond Dam consists of a stone masonry wall with an upstream earth embankment. The dam has a maximum height of 17 ft. and an overall length of 170 ft., including a 44.7 ft. long overflow spillway located near the center of the dam and auxiliary spillways located on each side of the main spillway with a total length of 50.5 ft. The outlet works consist of a 6 inch cast iron high level outlet and an 18-inch corrugated metal low level outlet or blowoff controlled by manually operated gates in a gate chamber at the left end of the main spillway. The dam impounds Burr Pond, a portion of Burr Pond State Park and is used for swimming, fishing and		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02254

REPLY TO  
ATTENTION OF  
NEDED

OCT 29 1960

Honorable Ella T. Grasso  
Governor of the State of Connecticut  
State Capitol  
Hartford, Connecticut 06115

Dear Governor Grasso:

Inclosed is a copy of the Burr Pond Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, State of Connecticut, Dept. of Environmental Protection, Hartford, CT.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely,

  
MAX B. SCHEIDER

Incl  
As stated

Colonel, Corps of Engineers  
Division Engineer

BURR POND DAM  
CT 00099

FARMINGTON RIVER BASIN  
TORRINGTON, CONNECTICUT



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PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM  
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT 00099  
NAME OF DAM: Burr Pond Dam  
TOWN: Torrington  
COUNTY AND STATE: Litchfield County, Connecticut  
STREAM: Unnamed Tributary to Still River  
DATE OF INSPECTION: May 2, 1980

BRIEF ASSESSMENT

The Burr Pond Dam consists of a stone masonry wall with an upstream earth embankment. The dam has a maximum height of 17 feet and an overall length of 170 feet, including a 44.7 foot long overflow spillway located near the center of the dam and auxiliary spillways located on each side of the main spillway with a total length of 50.5 feet. The outlet works consist of a 6-inch cast iron high level outlet and an 18-inch corrugated metal low level outlet or blowoff controlled by manually operated gates in a gate chamber at the left end of the main spillway.

The dam impounds Burr Pond, a portion of Burr Pond State Park and is used for swimming, fishing and boating.

Based on the visual inspection, the dam is judged to be in fair condition. Features that can affect the integrity of the dam are the seepage through the left side of the dam, erosion of the upstream slope of the dam, possible development of internal erosion along the root systems of trees near the downstream toe of the dam, and the poor condition of the low level outlet or blowoff pipe.

The dam is classified as "Small" in size, with a "High" hazard potential. A Test Flood equal to one-half the Probable Maximum Flood (1/2 PMF) was selected in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams. The Test Flood inflow is 1,425 cfs and the routed outflow of 720 cfs results in a freeboard from water surface to the top of the dam of 1.2 feet.

The spillway capacity with the water level at the top of the dam is 1,415 cfs and is equal to 197 percent of the routed Test Flood outflow.

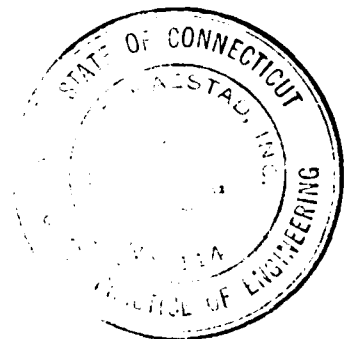
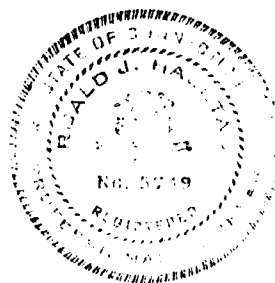
It is recommended that a qualified, registered engineer be retained to investigate the seepage on the downstream face of the dam; the erosion on the upstream slope of the dam; the removal of trees adjacent to the downstream toe; the condition and adequacy of the low level outlet or blowoff pipe; and to perform annual technical inspections of the dam. An operations and maintenance manual should also be prepared and a formal warning system should be put into effect.

The owner should implement these recommendations as described herein and in greater detail in Section 7 of the Report, within one year after receipt of this Phase I Inspection Report.

  
Ronald G. Litke, P.E.  
Project Engineer



  
Roald Haestad  
President





This Phase I Inspection Report on Burr Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Aramast Mahteslian

ARAMAST MAHTESLIAN, MEMBER  
Geotechnical Engineering Branch  
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

Richard J. DiBuono

RICHARD DIBUONO, CHAIRMAN  
Water Control Branch  
Engineering Division

APPROVAL RECORDED:

Joe B. Fryar  
JOE B. FRYAR  
Chief, Engineering Division

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the

condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety of the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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OVERVIEW PHOTO

U.S. ARMY ENGINEER DIV. NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASSACHUSETTS

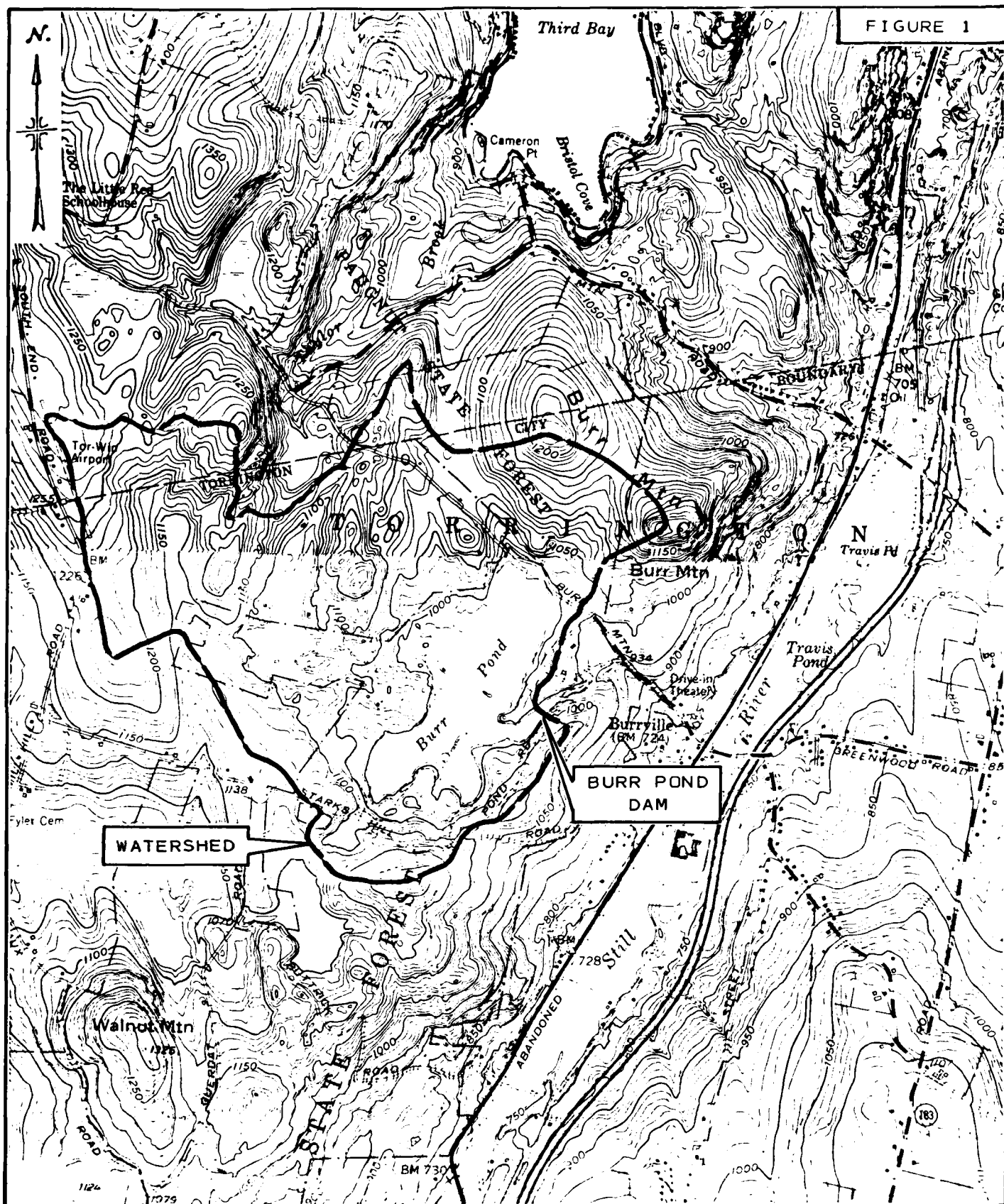
ROALD HAASTAD, INC.  
CONSULTING ENGINEERS  
WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

BURR POND DAM - CT 00099

TRIBUTARY TO STILL RIVER

TORRINGTON, CONNECTICUT      DATE: 19 APRIL '80



# LOCATION PLAN

BURR POND DAM  
TORRINGTON, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC.

TORRINGTON QUADRANGLE 1972



NATIONAL DAM INSPECTION PROGRAM  
PHASE I INSPECTION REPORT

PROJECT INFORMATION

SECTION 1

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Roald Haestad, Inc., has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Roald Haestad, Inc., under a letter of April 14, 1980, from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0048 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.
2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.
3. To update, verify and complete the National Inventory of Dams.

## 1.2 Description of Project

### a. Location

The dam is located on an unnamed tributary to the Still River, approximately 3,500 feet west of Connecticut Route 8 in the Burrville section of Torrington, Connecticut. The dam is shown on the Torrington Quadrangle Map having coordinates of latitude N 41° 52.1' and longitude W 73° 05.6'.

### b. Description of Dam and Appurtenant Structures

The Burr Pond Dam consists of a mortared stone masonry wall with an upstream earth embankment. The mortared stone masonry wall has a top width of 6 feet, a maximum height of 17 feet, a batter on the downstream face of 1 inch per foot, and an unknown cross-section. The earth embankment has a top width of 15 feet and an upstream slope of 2 horizontal to 1 vertical. The dam has an overall length of 170 feet, including a 44.7 foot long overflow spillway located near the center of the dam and auxiliary spillways 25 feet long to the left and 25.5 feet long to the right of the main spillway. The main spillway consists of an 8 inch thick concrete slab between stone masonry training walls. The distance from the main spillway crest to the top of the dam is 4.4 feet and the distance from the auxiliary spillway crest to the top of the dam is 1.4 feet. The top of the earth embankment is protected by stone riprap in the areas of the auxiliary spillway. The upstream slope of the earth embankment is protected by riprap only in the areas of the main and auxiliary spillways. The outlet works consist of a 6-inch cast iron high level outlet and an 18-inch corrugated metal low level outlet or blowoff controlled by manually

operated gates in a gate chamber located at the left end of the main spillway. The high level outlet discharges through the spillway face and the low level outlet or blowoff discharges below a downstream stone apron.

c. Size Classification - "Small"

According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, a dam is classified as "Small" if the height is between 25 feet and 40 feet, or the dam impounds between 50 Acre-Feet and 1,000 Acre-Feet. The dam has a maximum height of 17 feet and a maximum storage capacity of 855 Acre-Feet. Therefore, the dam is classified as "Small" in size based upon its maximum storage capacity of 855 Acre-Feet.

d. Hazard Classification - "High"

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the hazard classification for the dam is "High". A dam failure analysis indicates that three houses and three commercial establishments located downstream of the dam would be effected in the event of a dam breach, possibly resulting in the loss of more than a few lives. The depth of flow in the area of the commercial establishments would be 2.0 feet based on a dam breach with water level at spillway crest. A dam breach with the water level at the Test Flood elevation would not add substantially to the downstream hazard.

e. Ownership

Former Owner: Unknown

Present Owner: The State of Connecticut  
Department of Environmental Protection  
William Miller, Chief, Parks and Recreation  
165 Capitol Avenue  
Hartford, Connecticut 06115  
(203) 566-2304

f. Operator

Warren Whitney  
Burr Pond State Park  
Burr Mountain Road  
Torrington, Connecticut 06790  
(203) 482-1817

g. Purpose of Dam

The dam impounds Burr Pond which is used for swimming, fishing and boating.

h. Design and Construction History

There is no information available on the design and construction of the dam. It was reported that the dam was built during the 1930's by the Civilian Conservation Corps. Minor repairs have been made since the completion of the dam.

i. Normal Operational Procedures

There are no operational procedures for the dam. The low level outlet or blowoff is normally opened once a month during the summer to insure its operation.

### 1.3 Pertinent Data

#### a. Drainage Area

The drainage area consists of 1.34 square miles of "rolling" wooded terrain with very little development. Much of the drainage area is within the Paugnut State Forest.

#### b. Discharge at Damsite

The discharge at the damsite is normally over the 44.7' long overflow spillway. An additional 50.5' auxiliary spillway is 3' higher in elevation. Outlet works consist of a 6-inch high level outlet and an 18-inch low level outlet or blowoff controlled by manually operated upstream gates.

- |  |  |
|--|--|
| 1. Outlet Works (conduits) Size:                                       | 6-inch high level<br>18-inch low level (blowoff) |
| Invert Elevation:  | high level - 986.3<br>low level - 975.8          |
| Discharge Capacity:  | high level - 4 cfs<br>low level - 41 cfs         |
| 2. Maximum Known Flood at Damsite:                                     | Unknown  |
| 3. Ungated Spillway Capacity<br>at Top of Dam:<br>Elevation:           | 1,415 cfs *<br>992.4                             |
| 4. Ungated Spillway Capacity<br>at Test Flood Elevation:<br>Elevation: | 720 cfs<br>991.2                                 |
| 5. Gated Spillway Capacity<br>at Normal Pool Elevation:<br>Elevation:  | N/A  |
| 6. Gated Spillway Capacity<br>at Test Flood Elevation:<br>Elevation:   | N/A  |
| 7. Total Spillway Capacity<br>at Test Flood Elevation:<br>Elevation:   | 720 cfs<br>991.2                                 |
| 8. Total Project Discharge<br>at Top of Dam:<br>Elevation:             | 1,415 cfs *<br>992.4                             |
| 9. Total Project Discharge<br>at Test Flood Elevation:<br>Elevation:   | 720 cfs<br>991.2                                 |

\*Including Main and Auxiliary Spillways.

c. Elevation - Feet Above Mean Sea Level (NGVD)

1. Streambed at Toe of Dam:	975.8
2. Bottom of Cutoff:	Unknown
3. Maximum Tailwater:	N/A
4. Recreation Pool:	988
5. Full Flood Control Pool:	N/A
6. Spillway Crest:	988
7. Design Surcharge - Original Design:	Unknown
8. Top of Dam:	992.4
9. Test Flood Surcharge:	991.2

d. Reservoir - Length in Feet

1. Normal Pool:	4,000'
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	4,000'
4. Top of Dam:	4,000'
5. Test Flood Pool:	4,000'

e. Storage - Acre-feet

1. Normal Pool:	428 Acre-Feet
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	428 Acre-Feet
4. Top of Dam:	855 Acre-Feet
5. Test Flood Pool:	750 Acre-Feet

f. Reservoir Surface - Acres

1. Normal Pool:	84 Acres
2. Flood-Control Pool:	N/A
3. Spillway Crest:	84 Acres
4. Test Flood Pool:	107 Acres
5. Top of Dam:	111 Acres

g. Dam

- |                     |  |
|---------------------|--|
| 1. Type:            | Mortared Stone Masonry with up-stream earth embankment   |
| 2. Length:          | 170±   |
| 3. Height:          | 17'  |
| 4. Top Width:       | 6' - Stone Masonry<br>15' - Earth Embankment   |
| 5. Side Slopes:     | Downstream - Stone Masonry<br>1 Horizontal to 12 Vertical<br><br>Upstream - Earth Embankment<br>2 Horizontal to 1 Vertical |
| 6. Zoning:          | N/A  |
| 7. Impervious Core: | N/A  |
| 8. Cutoff:          | Unknown  |
| 9. Grout Curtain:   | Unknown  |
| 10. Other:          |  |

h. Diversion and Regulating Tunnel N/A

i.	<u>Spillway</u>	<u>Main Spillway</u>	<u>Auxiliary Spillway</u>
1.	Type:	Overflow spillway, concrete slab over stone masonry wall and earthen embankment	Crest and upstream slope of earth embankment protected by stone riprap
2.	Length of Weir:	44.7	50.5
3.	Crest Elevation with Flash Boards:	N/A	N/A
	without Flash Boards:	988	991
4.	Gates:	N/A	N/A
5.	Upstream Channel:	Riprap on upstream slope	Riprap on upstream slope
6.	Downstream Channel:	Natural streambed Mortared stone apron	Natural streambed Stone apron
7.	General:	Capacity with water level at crest of auxiliary spillway 640 cfs	
j.	<u>Regulating Outlets</u>	<u>High Level</u>	<u>Low Level (blowoff)</u>
1.	Invert @ Outlet:	986.3	975.8
2.	Size:	6-inch	18-inch
3.	Description:	Cast iron pipe	Corrugated metal pipe
4.	Control Mechanism:	Manually operated upstream gate	Manually operated upstream gate
5.	Other:	Capacity - 4 cfs	Capacity - 41 cfs



## ENGINEERING DATA

### SECTION 2

#### 2.1 Design Data

There was no design data available for review.

#### 2.2 Construction Data

The dam was reported to have been constructed by the Civilian Conservation Corps in the 1930's. There was no construction data available for review. Repairs were made to the gate chamber two years ago.

#### 2.3 Operation Data

There was no operational data available on the dam. It was reported that the blowoff gate was opened during the August 1955 Flood, but the depth of flow over the spillway was unknown. The maximum known depth over the spillway in recent years was reported to be 2 - 4 inches. It was also reported that it took approximately one month to lower the lake 5 feet in order to make repairs to the gate chamber two years ago.

#### 2.4 Evaluation of Data

##### a. Availability

There was no design or construction data available from the State of Connecticut, Department of Environmental Protection, owner of the dam.

##### b. Adequacy

As no design or construction data was available, the assessment of the dam was based on the visual inspection, past performance history and the hydraulic and hydrologic calculations performed for this report.

## VISUAL INSPECTION

### SECTION 3

#### 3.1 Findings

##### a. General

The visual inspection of the dam was conducted on May 2, 1980. At the time of inspection the water level was approximately 0.1 feet above spillway crest. The general condition of the dam at the time of inspection was fair.

The dam consists of a mortared stone masonry wall with an upstream earth embankment, an overflow spillway at approximately the center of the dam and outlet works located at the left end of the spillway section.

##### b. Dam

The crest of the dam in the vicinity of the spillway for a distance of 25± feet on either side of the training walls is approximately 1.4 feet lower than the remainder of the dam, Photo 1. The crest of this section of the dam has been armored with large stone riprap up to 2 feet in size. The riprap is missing or displaced in several areas, Photo 2. It appears this section of the dam acts as an auxiliary overflow spillway during periods of high flow. The remainder of the crest is covered with grass and small brush. An erosion path has developed near the junction of the dam with the left abutment, Photo 3.

Riprap is present on the upstream slope of the dam in the areas of the main and auxiliary spillways. Some minor slumping and erosion of the upstream slope has occurred in those areas which are not protected by riprap. The dam crest and upstream slope are generally covered with grass and small brush as noted in Photo 4.

The section of the downstream masonry wall to the left of the spillway was observed to be in fair condition. The mortar in the joints was generally tight with some mortar missing in random joints. Some seepage through this section of the wall was observed immediately to the left of the spillway. The flow was clear with no visible evidence of turbidity. A 6 inch high by 2 foot deep section of the wall was missing approximately 3 feet above the toe and 7 feet to the left of the spillway. Seepage was observed at this location, Photo 5.

The section of the downstream masonry wall to the right of the spillway has moss growing on the surface of the wall, Photo 6. The mortar in the joints was generally tight with some mortar missing in random joints. No seepage was observed on this section of wall.

Several evergreen and hardwood trees with trunk diameters up to 6 inches were observed within 10 feet of the downstream toe on the right side of the spillway, Photo 6, and on the left side of the spillway near the left abutment.

#### c. Appurtenant Structures

The appurtenant structures consist of the spillway, auxiliary spillway and outlet works. The concrete spillway slab appears to be in good condition with one crack noted near the gate chamber, Photo 7. Stone steps and the gate chamber for the outlet works are located within the spillway training walls. The stone masonry training walls also appeared to be in good condition, Photo 4. There is a stone apron downstream of the spillway sections of the dam. The stone apron in the area of the main spillway has been mortared. The concrete top of the gate chamber has been recently

repaired and is in excellent condition, Photo 8. As the chamber is normally full of water, the gates were not observed, but were reported to be operable. The low level outlet or blowoff is an 18-inch corrugated metal pipe discharging downstream of the stone masonry apron. The pipe is in poor condition with numerous holes rusted through, Photo 9. It appears that portions of the pipe are surrounded with concrete.

d. Reservoir Area

There are no indications of instability along the edges of the reservoir in the vicinity of the dam.

e. Downstream Channel

The downstream channel consisted of a meandering natural streambed in a wooded area. Some rock and wood debris were observed in the streambed, particularly near the base of the spillway, Photo 10.

3.2 Evaluation

Based on the results of the visual inspection the dam is judged to be in fair condition. The following conditions could affect the integrity of the dam:

1. Continued seepage through the dam to the left of the spillway could lead to internal erosion.
2. Continued erosion and sloughing of the upstream slope could lead to losses of crest width in those areas lacking riprap.
3. Areas in the auxiliary overflow spillway section where stone riprap paving has been displaced could lead to erosion of the dam during periods of peak flow.

4. The root systems of the trees located near the downstream toe could provide pathways for seepage and internal erosion and could cause damage to the dam should they uproot during a storm.

5. The deterioration of the low level outlet or blowoff pipe could lead to deterioration of the stone masonry wall.

## OPERATIONAL AND MAINTENANCE PROCEDURES

### SECTION 4

#### 4.1 Operational Procedures

##### a. General

The Burr Pond Dam impounds Burr Pond, which is used for recreation. There are no operational procedures for the dam. The low level outlet or blowoff gate is normally opened once a month during the summer to insure its operation.

##### b. Description of Any Warning System in Effect

There is no formal warning system in effect. The dam is checked during extremely heavy rains.

#### 4.2 Maintenance Procedures

##### a. General

Minor repairs are made as they are required. Portions of the stone masonry have been repointed, and portions of the gate chamber have been rebuilt.

##### b. Operating Facilities

Debris is removed from the spillway, intake channel and gate chamber as required. The low level outlet or blowoff gate is normally opened once a month during the summer to insure its operation.

#### 4.3 Evaluation

The present operational and maintenance procedures are adequate, but should be formalized. An operations and maintenance manual for the dam and operating facilities should be prepared. A formal warning system should be put into effect and should include monitoring the dam during heavy rains, and procedures for notifying downstream authorities. In addition, the dam should be inspected annually by a qualified, registered engineer.

## EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

### SECTION 5

#### 5.1 General

The main spillway for Burr Pond Dam is a 44.7 foot long overflow section located approximately at the center of the dam. Auxiliary spillways adjoin the main spillway on each side with a total length of 50.5 feet. See Figure 2, page B-1. The main spillway consists of a concrete slab with a vertical downstream masonry face. The auxiliary spillways are 3 feet higher than the main spillway and consist of upstream aprons of heavy riprap and a 6 foot wide stone masonry wall downstream with a batter of 1 inch per foot. Both the main spillway and the auxiliary spillways have downstream aprons of riprap. The crest of the dam is 1.4 feet above the auxiliary spillways.

A gate chamber is located at the left end of the spillway and contains valves for a 6-inch cast iron high level outlet which discharges through the downstream face of the spillway, and an 18-inch corrugated metal low level outlet or blowoff which discharges below the downstream stone masonry apron. The outlets have a combined capacity of 45 cfs with the water level at the top of the dam.

The dam has a tributary watershed of 1.34 square miles of "rolling" wooded terrain with very little development. Much of the watershed is within the Paugnut State Forest. Elevations within the watershed range from 1,290 feet at the western end to 988 feet at the spillway.

## 5.2 Design Data

No design data on the dam or spillway could be found.

## 5.3 Experience Data

During the August 1955 Flood the water was reported to have been about 1 foot above the auxiliary spillways with the dam vibrating severely. That depth would produce a flow over the spillway of 1,225 cfs or 170 percent of the Test Flood.

## 5.4 Test Flood Analysis

Based on the dam failure analysis, the dam is classified as "High" hazard potential. The size of the dam is "Small", based on the height of 17 feet and storage capacity of 855 Acre- Feet. According to the Recommended Guidelines for Safety Inspection of Dams, by the Corps of Engineers, the Test Flood should be in the range of 1/2 the Probable Maximum Flood (1/2 PMF) and the Probable Maximum Flood (PMF). A Test Flood equal to 1/2 PMF was selected because the height of the dam was on the low range for a "Small" dam. The Test Flood was calculated using a peak flow of 2,125 cubic feet per second per square mile (csm), for the minimum 2 square mile drainage area shown on the guide curves supplied by the Corps of Engineers for the PMF, and the 1.34 square mile watershed of Burr Pond Dam. The 1/2 PMF peak inflow was calculated to be 1,425 cfs and the routed outflow 720 cfs. The flood routing through the reservoir was done in accordance with "Estimating Effect of Surcharge Storage on Maximum Probable Discharges" provided by the Corps of Engineers.

The capacity of the main spillway plus auxiliary spillways was calculated to be 1,415 cfs or 197% of the routed Test Flood outflow. The Test Flood would not overtop the dam.



## 5.5 Dam Failure Analysis

A dam failure analysis was made using the "Rule of Thumb" guidance provided by the Corps of Engineers. Failure was assumed when the water level reached the top of the dam.

A dam breach with water level at the peak of the Test Flood (1/2 PMF) would release up to 3,910 cfs into the stream below the dam. The flood wave would travel downstream through a narrow, steep gorge at a depth of approximately 5.5 feet for a distance of 2,600 feet. Upon leaving the gorge, the flood waters would fan out, flooding a larger area and decreasing in depth. The flood waters would cross the Old Connecticut Route 8 at a depth of approximately 3.2 feet before entering Still River, where ample storage is available to dissipate the flood wave.

The residential housing upstream of Old Route 8 would incur damage mostly due to cellar flooding with water reaching the sill level of three houses. At three commercial establishments downstream of Old Route 8 the water level would be about 3 feet above the sills. The depth of flow in this area prior to dam breach would be approximately 1.7 feet based on the maximum spillway capacity of 1,415 cfs. Dam failure at the Test Flood level would not substantially increase the downstream hazard. The areas of potential flooding are shown on Figure 5, in Appendix D.

A dam breach at spillway level with no previous downstream flooding would release up to 1,785 cfs and would produce flood flows 2 feet deep at the commercial establishments.

The dam was classified as "High" potential hazard because of the possible loss of more than a few lives should the dam fail at spillway level.

## EVALUATION OF STRUCTURAL STABILITY

### SECTION 6

#### 6.1 Visual Observations

The visual inspection did not disclose any evidence of dam instability.

#### 6.2 Design and Construction Data

There was no design and construction data available for review. Therefore, the assessment of stability is based solely on the visual inspection.

#### 6.3 Post-Construction Changes

No known post-construction changes have been made which might jeopardize the integrity of the dam.

#### 6.4 Seismic Stability

The dam is located in Seismic Zone 1, and in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams does not warrant seismic analysis.

## ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES

### SECTION 7

#### 7.1 Dam Assessment

##### a. Condition

On the basis of the visual inspection, the dam is judged to be in fair condition. The future integrity of the dam could be affected by continued seepage through the left side of the dam; continued erosion of the upstream slope of the dam; possible development of internal erosion along the root systems of the trees near the downstream toe of the dam and possible damage to the dam should the trees uproot during a storm; and deterioration of the stone masonry as a result of the poor condition of the corrugated metal low level outlet or blowoff pipe.

##### b. Adequacy of Information

There was no design or construction information available, and thus, the assessment of the condition of the dam is based solely on the visual inspection.

##### c. Urgency

The recommendations presented in Sections 7.2 and 7.3 should be carried out within one year of receipt of this Report by the owner.

#### 7.2 Recommendations

The following recommendations should be carried out under the direction of a qualified, registered engineer.

1. The seepage and wet areas on the downstream face of the dam should be investigated and seepage control systems designed and constructed, as required.

2. The erosion of the upstream slope of the dam should be investigated and repairs and restoration of the upstream slope, including appropriate erosion protection, should be designed and constructed.

3. The trees and their roots located within 15 feet of the downstream toe should be removed and the root zones should be carefully backfilled with selected soils placed as directed by the engineer.

4. The condition of the low level outlet or blowoff pipe should be investigated and repairs made as required. The adequacy of the blowoff discharge capacity should also be evaluated.

### 7.3 Remedial Measures

#### a. Operation and Maintenance Procedures

1. Brush should be removed from the upstream slopes and crest of the dam.

2. Displaced riprap in the auxiliary spillways and along the upstream embankment should be replaced.

3. A program of annual technical inspections by a qualified, registered engineer should be instituted.

4. A formal operations and maintenance manual for the dam and operating facilities should be prepared.

5. A formal warning system should be put into effect and include monitoring of the dam during extremely heavy rains and procedures for notifying downstream authorities in the event of an emergency.

### 7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

VISUAL CHECK LIST WITH COMMENTS

# VISUAL INSPECTION CHECK LIST PARTY ORGANIZATION

PROJECT: Burr Pond Dam  
 DATE: 5/2/80 TIME: 8:00 am WEATHER: Cloudy 55°  
 W.S. ELEVATION: 988.1 U.S. N/A DN.S  
0.1 above spillway.

<u>PARTY</u>	<u>DISCIPLINE</u>
1. <u>Ronald G. Litke, P.E. - Roald Haestad, Inc.</u>	<u>Civil Engineer</u>
2. <u>Donald L. Smith, P.E. - Roald Haestad, Inc.</u> <u>Geotechnical</u>	<u>Civil/Hydrologist</u>
3. <u>Richard Murdock, P.E. - Engineers, Inc.</u>	<u>Geotechnical Engineer</u>
4. _____	_____
5. _____	_____
6. _____	_____

<u>PROJECT FEATURE</u>	<u>INSPECTED BY</u>	<u>REMARKS</u>
1. <u>Dam Embankment</u>	<u>RGL,DLS, RM</u>	<u>Good condition.</u>
2. <u>Outlet Works - Intake Channel</u>		
3. <u>and Intake Structure</u>	<u>RGL,DLS, RM</u>	<u>Normally under water.</u>
4. <u>Outlet Works -</u>		<u>Normally full of water.</u>
5. <u>Control Tower</u>	<u>RGL,DLS</u>	<u>Gates reported operable.</u>
6. <u>Outlet Works -</u>		<u>Low level outlet corrugated</u>
7. <u>Transition and Conduit</u>	<u>RGL,DLS</u>	<u>metal pipe in poor condition.</u>
8. <u>Outlet Works - Outlet Structure</u>		<u>Discharge to</u>
9. <u>and Outlet Channel</u>	<u>RGL,DLS</u>	<u>natural stream.</u>
10. <u>Outlet Works - Spillway Weir,</u>		
11. <u>Approach and Disch. Channels</u>	<u>RGL,DLS, RM</u>	<u>Good condition.</u>
12. _____		
_____		
_____		
_____		
_____		
_____		
_____		
_____		

# PERIODIC INSPECTION CHECK LIST

PROJECT: Burr Pond Dam DATE: 5/2/80

PROJECT FEATURE: Dam Embankment NAME: RGL, DLS

DISCIPLINE: Civil and Geotechnical Engineers NAME: RM

AREA ELEVATION	CONDITIONS
<u>DAM EMBANKMENT</u>	
<u>CREST ELEVATION</u>	992.4
<u>CURRENT POOL ELEVATION</u>	988.1 (0.1' above spillway level)
<u>MAXIMUM KNOWN IMPOUNDMENT TO DATE</u>	988.3 (during recent years)
<u>SURFACE CRACKS</u>	None observed.
<u>PAVEMENT CONDITION</u>	Grass, stone paving in the auxiliary spillway section.
<u>MOVEMENT OR SETTLEMENT OF CREST</u>	None observed.
<u>LATERAL MOVEMENT</u>	None observed.
<u>VERTICAL ALIGNMENT</u>	Good.
<u>HORIZONTAL ALIGNMENT</u>	Good.
<u>CONDITION AT ABUTMENT AND AT CONCRETE STRUCTURES</u>	Good.
<u>INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES</u>	None.
<u>TRESPASSING ON SLOPES</u>	Some erosion near left abutment.
<u>VEGETATION ON SLOPES</u>	Several trees located within 10 ft. downstream of toe of dam.
<u>SLOUGHING OR EROSION OF SLOPES OR ABUTMENTS</u>	Erosion and minor sloughing of upstream slope.
<u>ROCK SLOPE PROTECTION - RIPRAP FAILURES</u>	Riprap present only along overflow spillway section, both upstream and on crest, missing or displaced at some locations.
<u>UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES</u>	None observed.
<u>UNUSUAL EMBANKMENT OR DOWNSTREAM SEEPAGE</u>	Seepage exiting downstream masonry wall to left of spillway.
<u>PIPING OR BOILS</u>	None observed.
<u>FOUNDATION DRAINAGE FEATURES</u>	None known or observed.
<u>TOE DRAINS</u>	None known or observed.
<u>INSTRUMENTATION SYSTEM</u>	None known or observed.

# PERIODIC INSPECTION CHECK LIST

PROJECT: Burr Pond Dam DATE: 5/2/80  
Intake Channel  
 PROJECT FEATURE: Outlet Works - and Intake Structure NAME: RGL,DLS  
 DISCIPLINE: Civil and Geotechnical Engineers NAME: RM

AREA EVALUATED	CONDITIONS
<u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u>	
A. <u>APPROACH CHANNEL:</u>	3 ft. wide channel at left side of spillway.
<u>SLOPE CONDITIONS</u>	N/A
<u>BOTTOM CONDITIONS</u>	Could not be observed.
<u>ROCK SLIDES OR FALLS</u>	N/A
<u>LOG BOOM</u>	N/A
<u>DEBRIS</u>	None
<u>CONDITION OF CONCRETE LINING</u>	Fair
<u>DRAINS OR WEEP HOLES</u>	N/A
B. <u>INTAKE STRUCTURE:</u>	
<u>CONDITION OF CONCRETE</u>	Good
<u>STOP LOGS AND SLOTS</u>	N/A

OTHER:

Bar screen over intake.



# PERIODIC INSPECTION CHECK LIST

PROJECT: Burr Pond Dam DATE: 5/2/80

PROJECT FEATURE: Outlet Works - Control Tower NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
<u>OUTLET WORKS - CONTROL TOWER</u>	
A. <u>CONCRETE AND STRUCTURAL:</u>	
<u>GENERAL CONDITION</u>	Concrete at top fairly new. Excellent condition.
<u>CONDITION OF JOINTS</u>	N/A
<u>SPALLING</u>	None
<u>VISIBLE REINFORCING</u>	None
<u>RUSTING OR STAINING OF CONCRETE</u>	None
<u>ANY SEEPAGE OR EFFLORESCENCE</u>	None observed. Chamber normally full of water.
<u>JOINT ALIGNMENT</u>	N/A
<u>UNUSUAL SEEPAGE OR LEAKS IN GATE CHAMBER</u>	None observed. Chamber normally full of water.
<u>CRACKS</u>	Crack in spillway slab near chamber.
<u>RUSTING OR CORROSION OF STEEL</u>	Grate rusted.
B. <u>MECHANICAL AND ELECTRICAL:</u>	
<u>AIR VENTS</u>	N/A
<u>FLOAT WELLS</u>	N/A
<u>CRANE HOIST</u>	N/A
<u>ELEVATOR</u>	N/A
<u>HYDRAULIC SYSTEM</u>	N/A
<u>SERVICE GATES</u>	Could not be observed. Reported to be operable.
<u>EMERGENCY GATES</u>	N/A
<u>LIGHTNING PROTECTION SYSTEM</u>	N/A
<u>EMERGENCY POWER SYSTEM</u>	N/A
<u>WIRING AND LIGHTING SYSTEM IN GATE CHAMBER</u>	N/A

# PERIODIC INSPECTION CHECK LIST

PROJECT: Burr Pond Dam DATE: 5/2/80  
 PROJECT FEATURE: Outlet Works - Transition and Conduit NAME: RGL  
 DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	Corrugated metal pipe badly deteriorated. Appears to be partially encased in concrete.
GENERAL CONDITION OF CONCRETE	
RUST OR STAINING ON CONCRETE	N/A
SPALLING	N/A
EROSION OR CAVITATION	N/A
CRACKING	N/A
ALIGNMENT OF MONOLITHS	N/A
ALIGNMENT OF JOINTS	N/A
NUMBERING OF MONOLITHS	N/A

# PERIODIC INSPECTION CHECK LIST

PROJECT: Burr Pond Dam DATE: 5/2/80  
 PROJECT FEATURE: Outlet Structure and Outlet Works - Outlet Channel NAME: RGL  
 DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	No outlet structure. Outlet pipes discharge to natural stream below dam.
GENERAL CONDITION OF CONCRETE	N/A
RUST OR STAINING	N/A
SPALLING	N/A
EROSION OR CAVITATION	N/A
VISIBLE REINFORCING	N/A
ANY SEEPAGE OR EFFLORESCENCE	N/A
CONDITION AT JOINTS	N/A
DRAIN HOLES	N/A
CHANNEL	Natural stream.
LOOSE ROCK OR TREES OVERHANGING CHANNEL	Some loose rock and debris.
CONDITION OF DISCHARGE CHANNEL	Natural stream.

# PERIODIC INSPECTION CHECK LIST

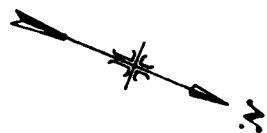
PROJECT: Burr Pond Dam DATE: 5/2/80  
 PROJECT FEATURE: Spillway Weir, Approach Outlet Works - & Discharge Channels NAME: RGL,DLS  
 DISCIPLINE: Civil and Geotechnical Engineers NAME: RM

AREA EVALUATED	CONDITIONS
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
A. <u>APPROACH CHANNEL:</u>	Underwater - upstream face of dam.
<u>GENERAL CONDITION</u>	Good
<u>LOOSE ROCK OVERHANGING CHANNEL</u>	N/A
<u>TREES OVERHANGING CHANNEL</u>	N/A
<u>FLOOR OF APPROACH CHANNEL</u>	Riprap slope protection on upstream slope.
B. <u>WEIR AND TRAINING WALLS:</u>	
<u>GENERAL CONDITION OF CONCRETE</u>	Good
<u>RUST OR STAINING</u>	None observed
<u>SPALLING</u>	Minor deterioration. Crack in spillway slab at gate chamber.*
<u>ANY VISIBLE REINFORCING</u>	None observed.
<u>ANY SEEPAGE OR EFFLORESCENCE</u>	None observed.
<u>DRAIN HOLES</u>	None observed.
C. <u>DISCHARGE CHANNEL:</u>	
<u>GENERAL CONDITION</u>	Good
<u>LOOSE ROCK OVERHANGING CHANNEL</u>	Some large rocks adjacent to channel.
<u>TREES OVERHANGING CHANNEL</u>	Some trees growing in channel and on bank.
<u>FLOOR OF CHANNEL</u>	Stone apron downstream of dam. Natural streambed.
<u>OTHER OBSTRUCTIONS</u>	Some rock and wood debris in floor of channel.

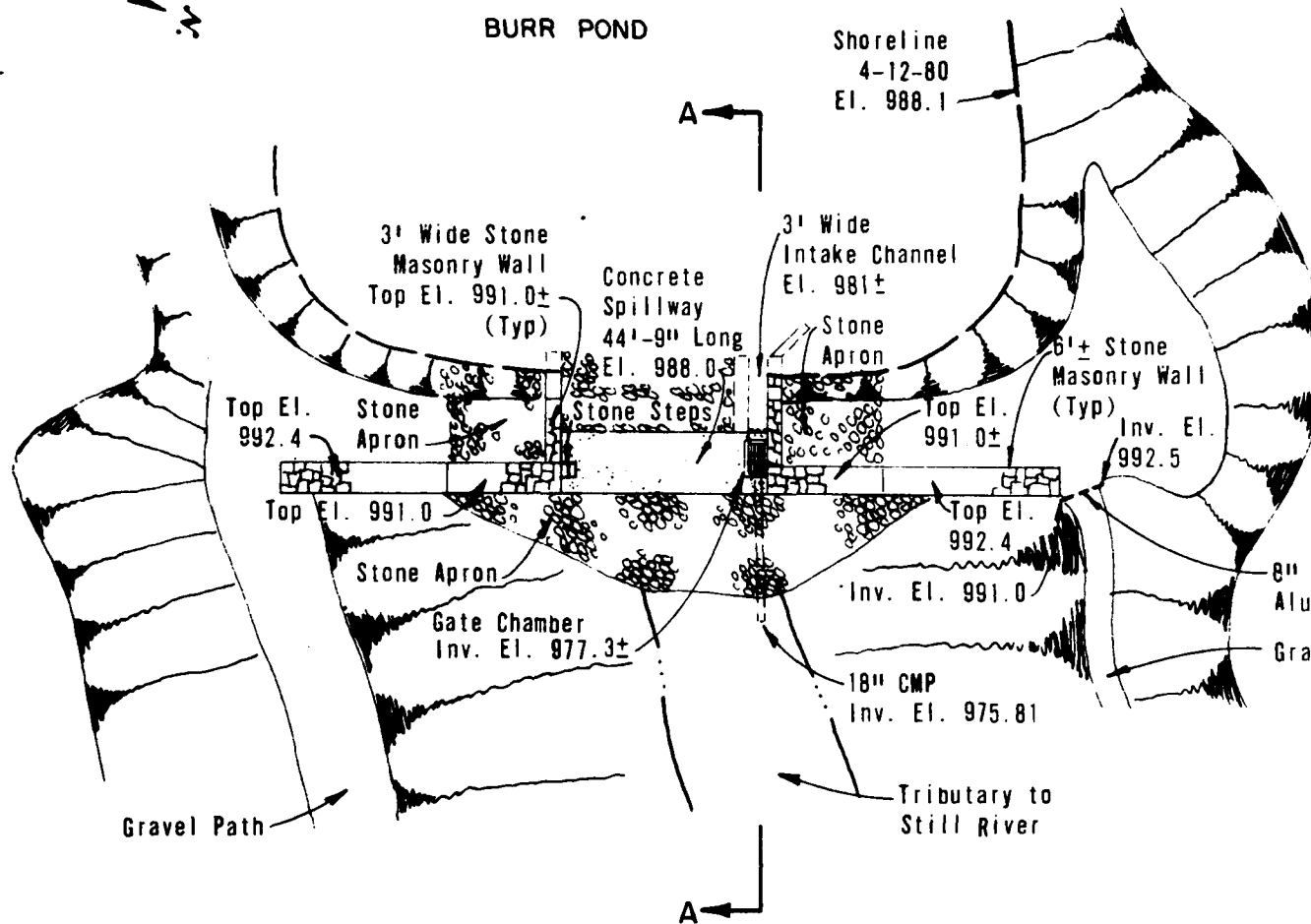
\*The crack extends from the downstream edge of the spillway to the right corner of the gate chamber. The crack appears to be open approximately 1/5" with the upper surface spalled from 1-1/2" to 4".

APPENDIX B

ENGINEERING DATA

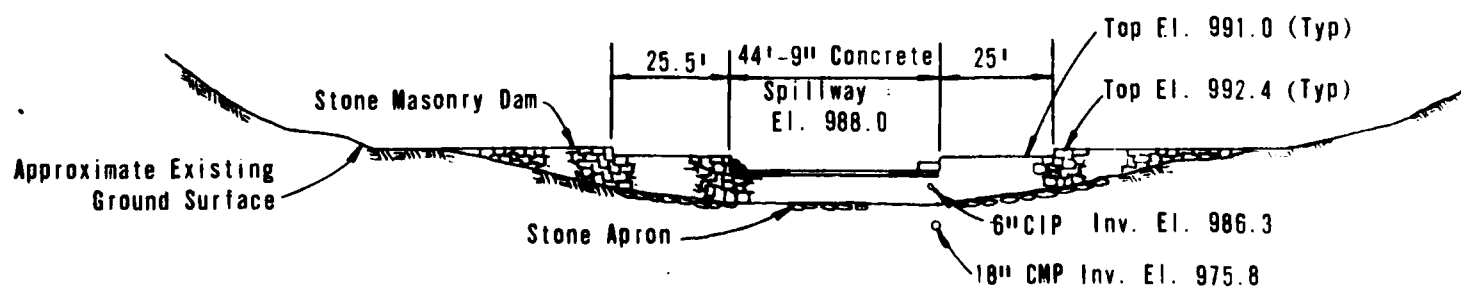


# BURR POND



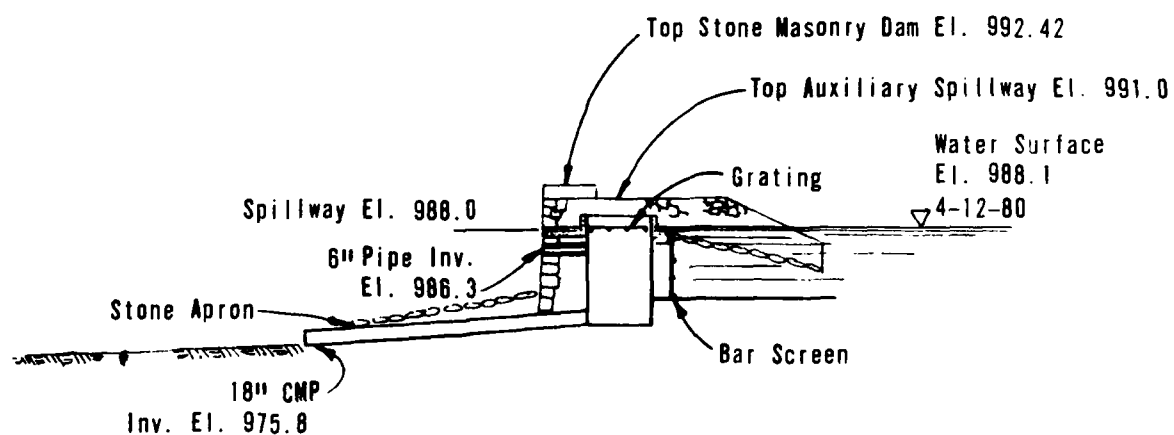
## PLAN

Scale: 1" = 40'



## ELEVATION

Scale: 1" = 40'



## SECTION A-A

Scale: 1" = 20'

ROALD HAESTAD, INC.  
CONSULTING ENGINEERS  
WATERBURY, CONNECTICUT

U.S. ARMY ENGINEER DIV NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

## BURR POND DAM

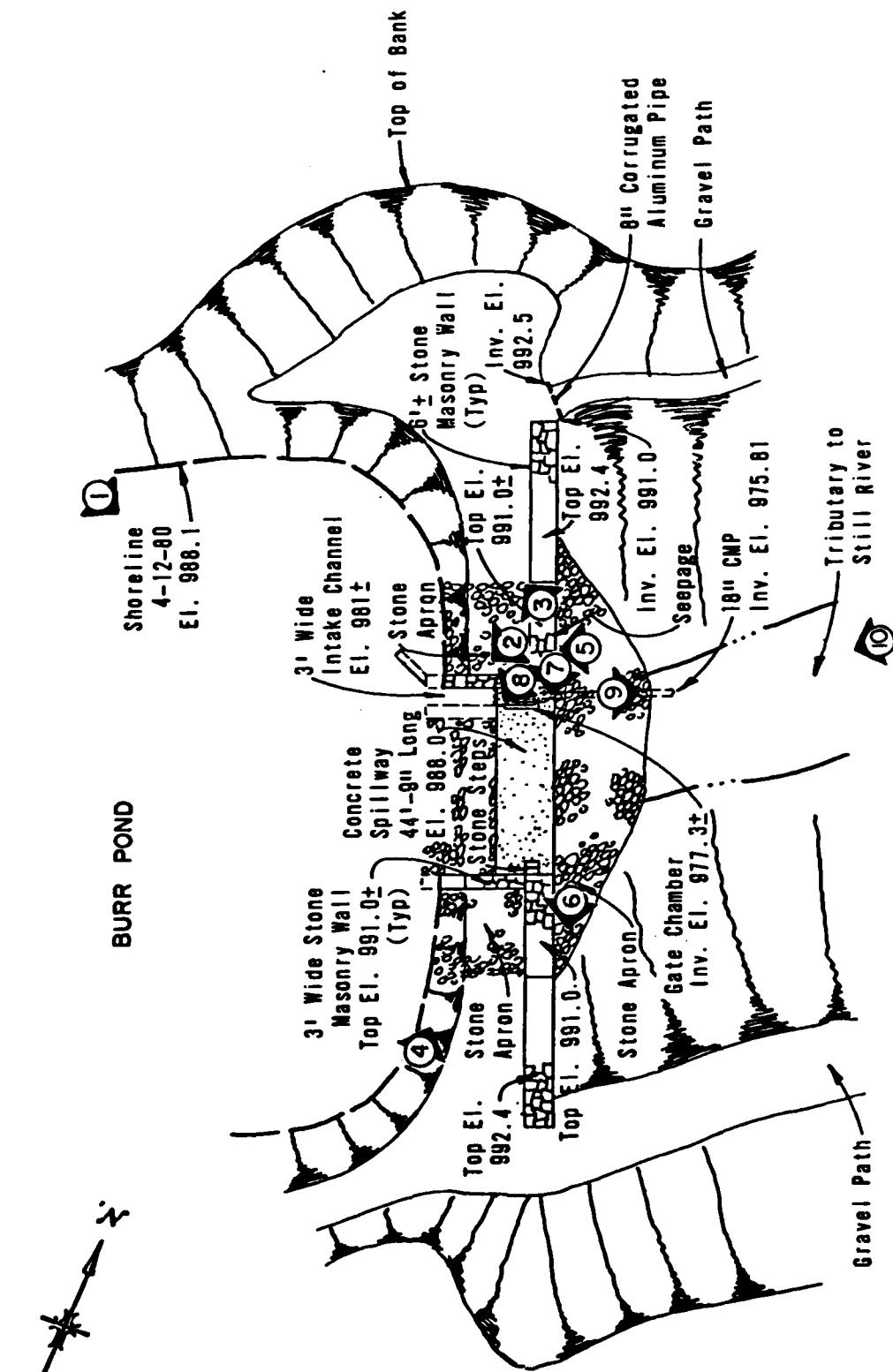
DRAWN	CHECKED	APPROVED	SCALE	AS NOTED
JRS	RGL	RH	DATE JUNE 1980	PAGE B-1

APPENDIX C

PHOTOGRAPHS



FIGURE 3



ROALD HALESTAD, INC.  
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U.S. ARMY ENGINEER DIV. NEW ENGLAND  
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WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

# PHOTO LOCATION PLAN

BURR POND DAM  
TORRINGTON, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALE	DATE	PAGE
JRS	RGL	RH	1" = 40'	JUNE 1980	C-1

Denotes photo number and direction in which photo was taken



PHOTO NO. 1

DAM FROM UPSTREAM.  
NOTE MAIN SPILLWAY  
AND AUXILIARY  
SPILLWAYS



PHOTO NO. 2

MISSING SECTIONS OF  
RIPRAP ADJACENT TO LEFT  
SPILLWAY TRAINING WALL.

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WALTHAM, MASSACHUSETTS

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WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

BURR POND DAM  
TR. TO STILL RIVER  
TORRINGTON, CONNECTICUT  
CT 00099  
2 MAY '80



PHOTO NO. 3

CREST FROM LEFT  
SPILLWAY TRAINING  
WALL. NOTE PATH NEAR  
LEFT ABUTMENT.



PHOTO NO. 4

UPSTREAM FACE FROM  
RIGHT ABUTMENT.  
NOTE GRASS COVER  
AND SMALL BRUSH.

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NON-FED. DAMS

BURR POND DAM  
TR. TO STILL RIVER  
TORRINGTON, CONNECTICUT  
CT 00099  
2 MAY '80



PHOTO NO. 5

SEEP IN STONE MASONRY WALL,  
3' UP FROM TOE,  
7' TO LEFT OF EDGE OF SPILLWAY



PHOTO NO. 6

DOWNSTREAM FACE  
RIGHT SIDE OF DAM,  
NOTE MOSS ON FACE AND  
TREES DOWNSTREAM OF DAM

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BURR POND DAM  
TR. TO STILL RIVER  
TORRINGTON, CONNECTICUT  
CT 00099  
2 MAY '80



PHOTO NO. 7

CRACK IN  
SPILLWAY SLAB  
AT GATE CHAMBER.



PHOTO NO. 8

GATE CHAMBER.  
NOTE LOCATION WITHIN  
SPILLWAY TRAINING WALLS.

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NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

BURR POND DAM  
TR. TO STILL RIVER  
TORRINGTON, CONNECTICUT  
CT 00099  
2 MAY '80



PHOTO NO. 9

18-INCH CORRUGATED  
METAL LOW LEVEL OUTLET  
OR BLOWOFF PIPE.  
NOTE DETERIORATION  
OF PIPE.



PHOTO NO. 10

DOWNSTREAM  
CHANNEL. NOTE  
LOOSE ROCK  
AND DEBRIS.

U.S. ARMY ENGINEER DIV. NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASSACHUSETTS

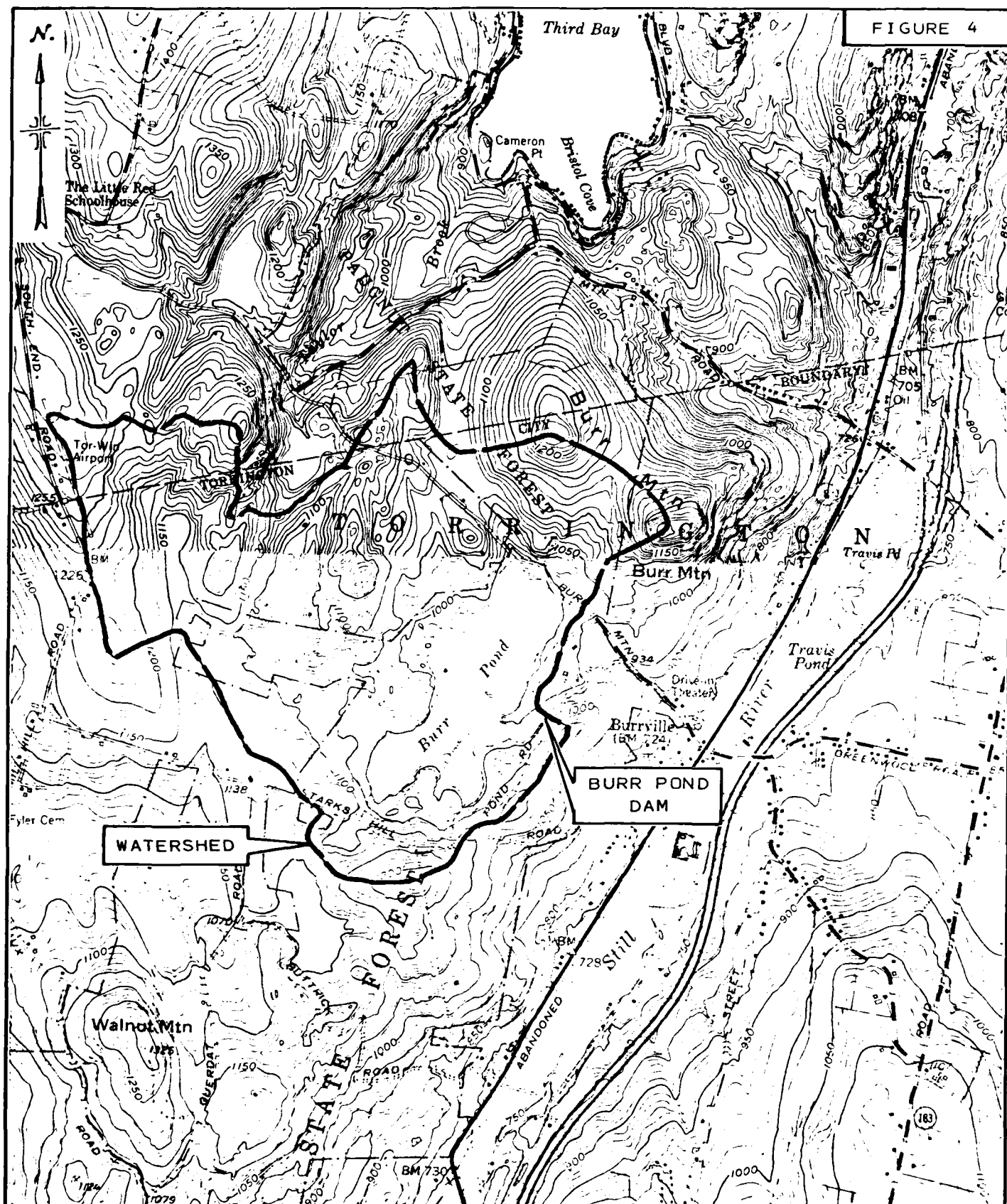
ROALD HAESTAD, INC.  
CONSULTING ENGINEERS  
WATERBURY, CONNECTICUT

NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

BURR POND DAM  
TR. TO STILL RIVER  
TORRINGTON, CONNECTICUT  
CT 00099  
2 MAY '80

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS



WATERSHED MAP  
BURR POND DAM  
TORRINGTON, CONNECTICUT

SCALE: 1" = 2000'

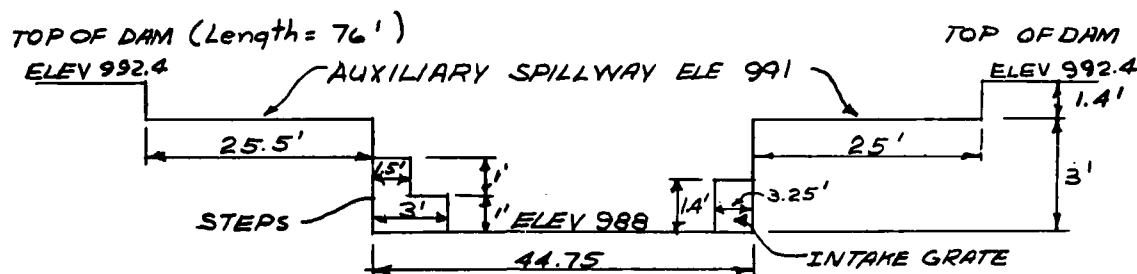
ROALD HAESTAD, INC.

TORRINGTON QUADRANGLE 1972



BY SAL DATE 5/7/80 **ROALD HAESTAD, INC.** SHEET NO 1 OF 10  
CONSULTING ENGINEERS  
CKD BY DLS DATE 5/29/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-017  
SUBJECT BURR POND DAM - Discharge Capacity

Spillway Profile:



Spillway & Auxiliary Spillway Discharge Coeff = 3.0

$$\begin{aligned} \text{Spillway Capacity (to auxiliary spillway level)} &= CLH^{3/2} + CLH^{3/2} + CLH^{3/2} + CLH^{3/2} \\ &= 3(38.5)(3)^{1.5} + 3(15)(2)^{1.5} + 3(1.5)(1)^{1.5} + 3(3.25)(1.4)^{1.5} \\ &= 637 \text{ cfs} \end{aligned}$$

$$\begin{aligned} \text{Spillway Capacity (Top of dam)} &= CLH^{3/2} + CLH^{3/2} + CLH^{3/2} + CLH^{3/2} + CLH^{3/2} \\ &= 3(38.5)(4.4)^{1.5} + 3(15)(3.4)^{1.5} + 3(15)(2.4)^{1.5} + 3(3.25)(3)^{1.5} + 3(0.5)(1.4)^{1.5} \\ &= 1,413 \text{ cfs} \end{aligned}$$

ELEVATION (FEET)	MAIN SPILLWAY				AUXILIARY SPILLWAY (cfs)	TOP OF DAM (cfs)	TOTAL DISC. CAP. (cfs)
	SECT NO1 (cfs)	SECT NO2 (cfs)	SECT NO3 (cfs)	SECT NO4 (cfs)			
988	0	0	0	0	0	0	0
989	116	0	0	0	0	0	116
990	327	5	5	0	0	0	337
991	600	13	20	5	0	0	638
992	924	23	41	13	151	0	1,152
992.4	1066	28	51	17	251	0	1,413
993	1,291	36	67	23	429	106	1,952

BY SAL DATE 5/7/80

**ROALD HAESTAD, INC.**  
CONSULTING ENGINEERS

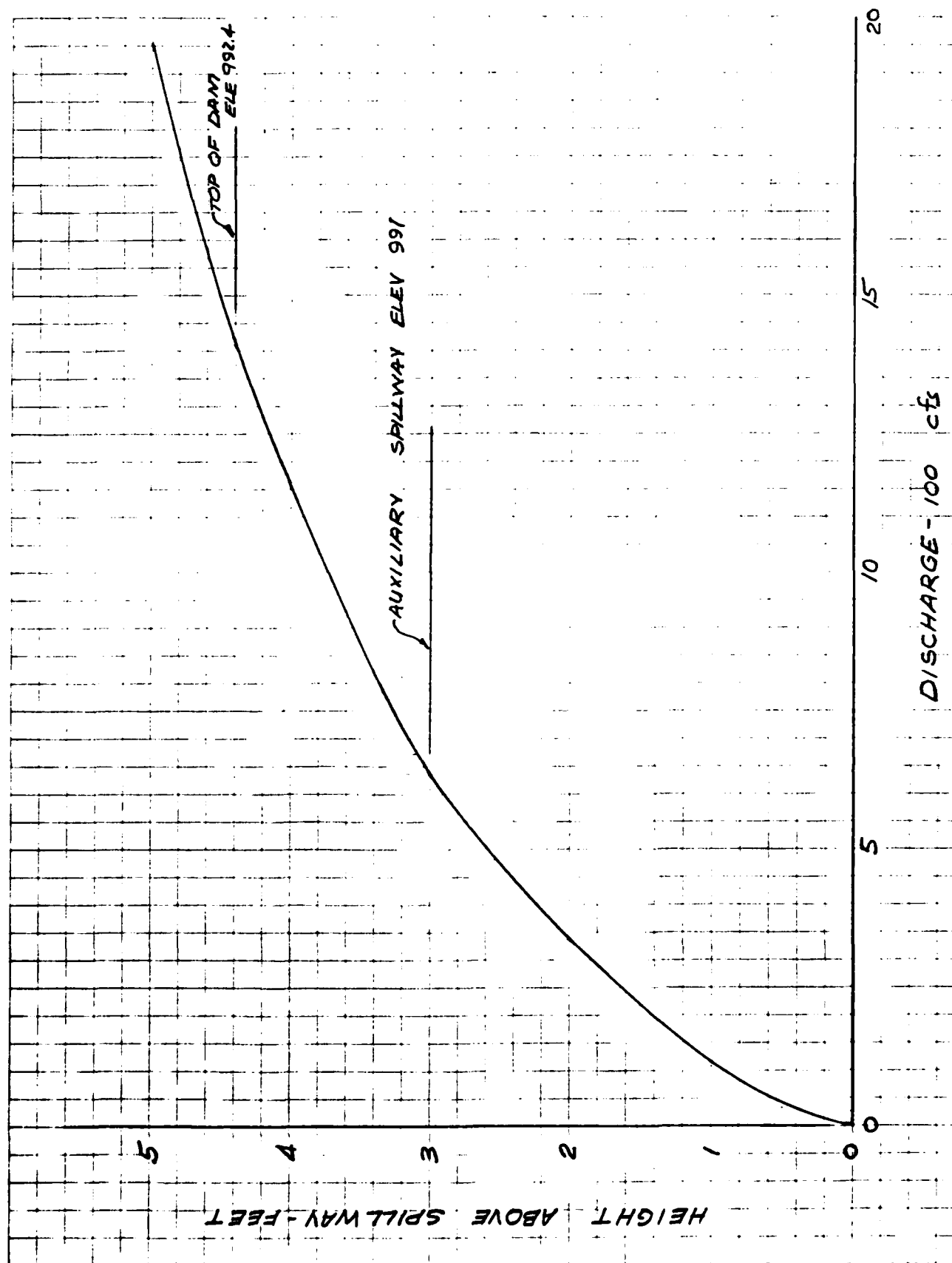
SHEET NO. 2 OF 10

CKD BY DLB DATE 5/9/80

37 Brookside Road - Waterbury, Conn. 06708

JOB NO. 049-17

SUBJECT BURR POND DAM - Discharge Capacity Curve



BY D.H.S. DATE 5/11/80

ROALD HAESTAD, INC.

SHEET NO 3 OF 10

CONSULTING ENGINEERS

CKD BY SAL DATE 5/16/80

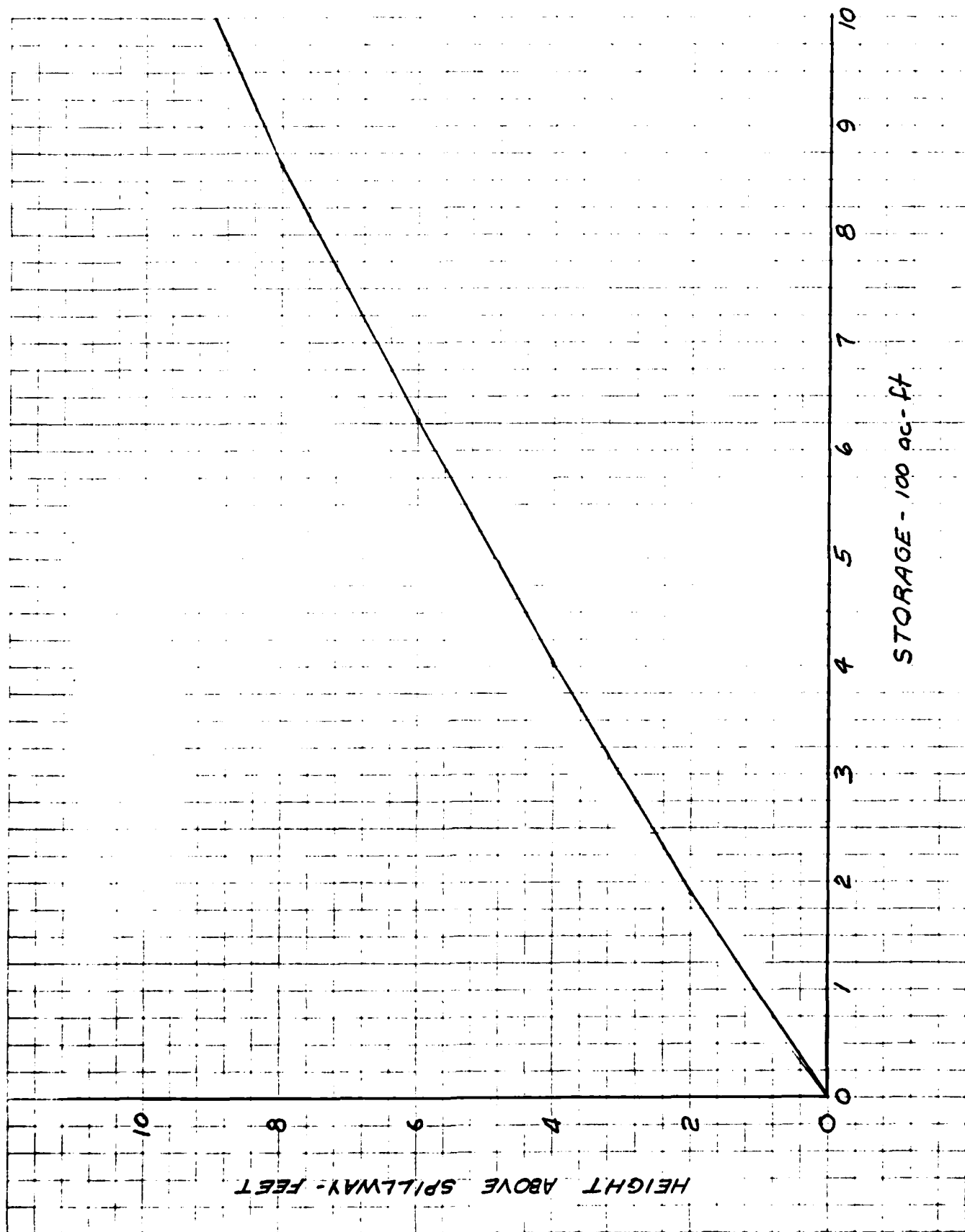
37 Brookside Road - Waterbury, Conn. 06708

JOB NO 49-017SUBJECT BURR POND DAM - STORAGE CAPACITY ABOVE SPILLWAY

<u>ELEVATION</u>	<u>ACRES</u>	<u>ACRE- FEET</u>	<u>TOTAL ACRE- FEET</u>
988	84 *	0	0
990	104 *	188	188
992	110	214	402
994	115	225	627
996	121	236	863
998	126	247	1110
1000	132 *	258	1368

\* Planimetered

BY SAL DATE 5/7/80 **ROALD HAESTAD, INC.** SHEET NO 4 OF 10  
CONSULTING ENGINEERS  
CKD BY DLS DATE 5/9/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-17  
SUBJECT BURR POND DAM - Storage Capacity Above Spillway



BY...SAL...DATE 5/7/80... **ROALD HAESTAD, INC.** SHEET NO. 5 OF 10  
CONSULTING ENGINEERS  
CKD BY DL DATE 5/7/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO. 049-17  
SUBJECT BURR POND DAM - Test Flood

TEST FLOOD =  $\frac{1}{2}$  PMF

Drainage Area = 857 acres = 1.34 sq. mi.

From CORPS OF ENG Chart for "Rolling" Terrain

MPF = 2,125 cfs/sq. mi. (2.0 sq. mi. minimum)

PMF = 2,125 cfs/sq. mi.  $\times$  1.34 sq. mi. = 2,848 cfs

$\frac{1}{2}$  PMF =  $\frac{1}{2}$  (2848) = 1,424 cfs

$Q_{p1}$  = 1,424 cfs

$H_1$  = 4.4' above spillway, from Discharge Curve

STOR<sub>1</sub> = 450 ac-ft from Storage Capacity Curve

= 6.3 inches of runoff from 1.34 sq. mi.

MPF runoff in New England equals approx 19"  $\therefore$  for  $\frac{1}{2}$  PMF runoff equals approx.  $\frac{1}{2}$  (19") = 9.5"

$Q_{p2} = Q_{p1} (1 - \text{STOR}_1 / 9.5) = 1,424 \text{ cfs } (1 - \frac{6.3}{9.5}) = 480 \text{ cfs}$

$H_2$  = 2.5'

STOR<sub>2</sub> = 245 ac-ft

STOR<sub>AVE</sub> = (STOR<sub>1</sub> + STOR<sub>2</sub>) / 2 = (480 + 245) / 2 = 363 ac-ft

= 5.0" of runoff

$Q_{p3} = Q_{p1} (1 - \text{STOR}_{AVE} / 9.5) = 1,424 \text{ cfs } (1 - \frac{5.0}{9.5}) = 675 \text{ cfs}$

$H_3$  = 3.1 ft

STOR<sub>3</sub> = 305 ac-ft

STOR<sub>AVE</sub> = (STOR<sub>AVE</sub> + STOR<sub>3</sub>) / 2 = (363 + 305) / 2 = 334 ac-ft  
= 4.7" of runoff

$Q_{p2} = Q_{p1} (1 - \text{STOR}_{AVE} / 9.5) = 1,424 \text{ cfs } (1 - \frac{4.7}{9.5}) = 719 \text{ cfs} \rightarrow H_3 = 3.2 \text{ ft}$

Spillway Capacity (Top of dam) = 1,374 cfs (See Page D-2)

% of  $\frac{1}{2}$  PMF =  $(1,413 / 719) \times 100 = 197\%$  of  $\frac{1}{2}$  PMF

BY SAL..... DATE 8/12/80 **ROALD HAESTAD, INC.** SHEET NO..... OF.....  
CONSULTING ENGINEERS  
CKD BY ... DATE 8/13/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 49-017.....  
SUBJECT BURR POND DAM - Dam Breach Calculations.....

FAILURE AT 1/2 PMF LEVEL:

$$Q_A = \text{Peak Failure Outflow} = \frac{8}{27} W_b (\sqrt{g}) (Y_o)^{3/2}$$

$W_b = \text{Breach Width} = 40\% \text{ of dam length across river at mid height} = 0.4(93) = 37.2 \text{ use } 37'$

$Y_o = \text{Total height from river bed to pool level at time of failure} = 15.8'$

$$Q_{p1} = \frac{8}{27} (37) (\sqrt{32.2}) (15.8)^{3/2} = 3,906.9 \text{ use } 3,910 \text{ cfs}$$

At Section No 2. the resulting depth of flow would be 3.2 Feet

FAILURE AT SPILLWAY LEVEL:

$$W_b = \text{Breach Width} = 0.4(60) = 24'$$

$Y_o = \text{Total height from river bed to pool level at time of failure} = 12.5'$

$$Q_{p1} = \frac{8}{27} (24) (\sqrt{32.2}) (12.5)^{3/2} = 1,783.3 \text{ use } 1,785 \text{ cfs}$$

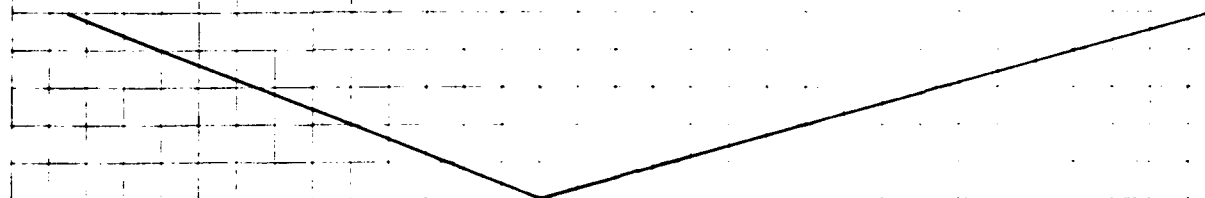
At Section No. 2 the resulting depth of flow would be 2.0 Feet.

BY SAL DATE 5/16/80 **ROALD HAESTAD, INC.** SHEET NO. 7 OF 10  
CONSULTING ENGINEERS  
CKD BY DLB DATE 5/29/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO. 49-Q17  
SUBJECT BURR POND DAM - Flood Routing

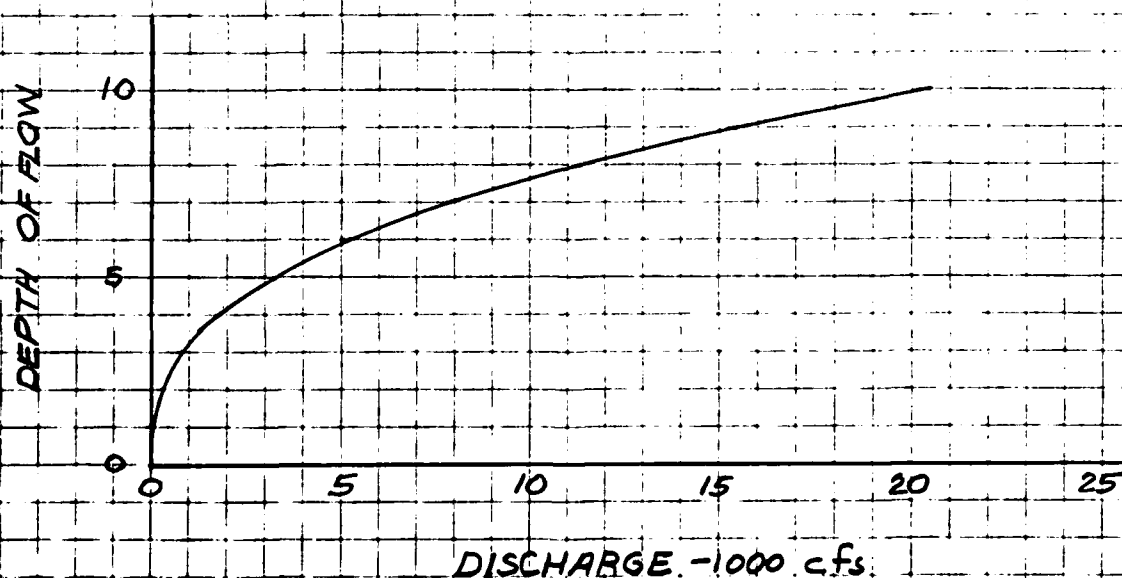
SECTION NO 1

Scale: 1" = 20' Horiz.  
1" = 10' Vert

$n = 0.04$   $s = 0.10$



<u>H</u>	<u>Wp</u>	<u>A</u>	<u>R</u>	<u>S</u>	<u>V</u>	<u>Q</u>
1	12	6	0.49	0.1	7.33	44
2	24	24	0.99	0.1	11.64	279
3	37	54	1.48	0.1	15.25	824
4	49	96	1.97	0.1	18.47	1,774
5	61	150	2.47	0.1	21.44	3,216
6	73	216	2.96	0.1	24.21	5,229
7	85	294	3.45	0.1	26.83	7,888
8	97	384	3.94	0.1	29.33	11,261
9	110	486	4.44	0.1	31.72	15,417
10	122	600	4.93	0.1	34.03	20,418



BY ...SAL... DATE 4/14/80...

ROALD HAESTAD, INC.

SHEET NO. 8 OF 10

CONSULTING ENGINEERS

CKD BY DLS DATE 5/9/80...

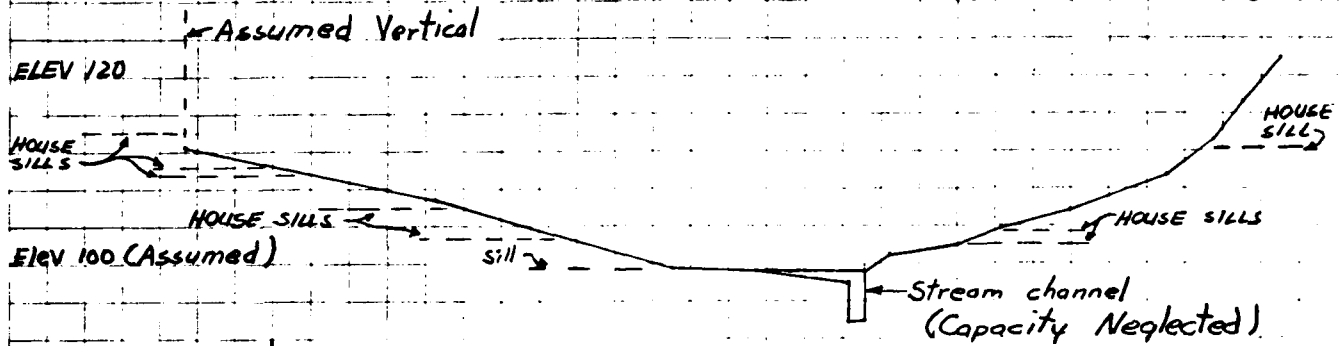
37 Brookside Road - Waterbury, Conn. 06708

JOB NO. 042-17

SUBJECT BURR DAM - Flood Routing

# SECTION 2 (Burr Ntn. Rd., Old Route 8, & Starks Hill Rd.)

Scale: 1" = 200' Horiz  
1" = 20' Vert

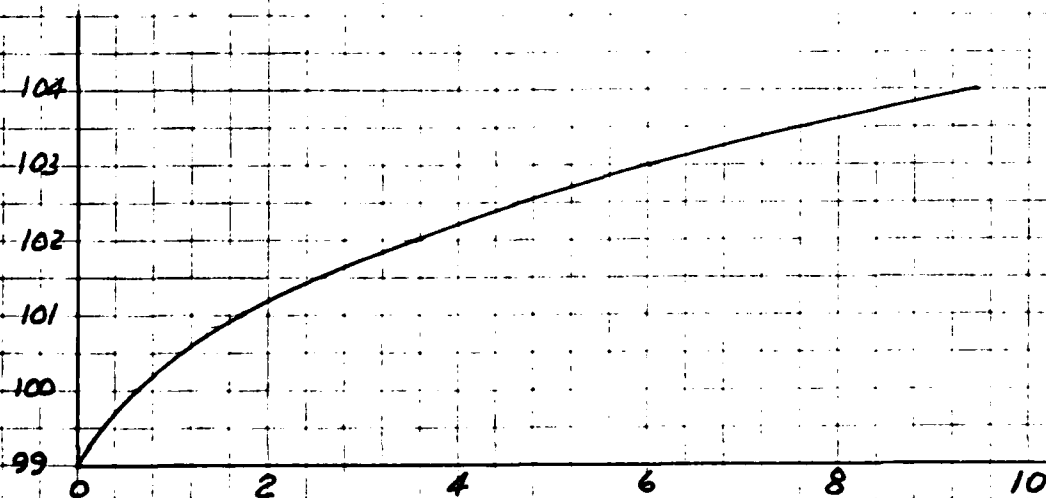


Elevation  $Q = CLH^{3/2}$

ASSUME  $C = 2.5$

99	0
100	613
101	1,732
102	3,583
103	6,031
104	9,326

ELEVATIONS REFER TO AN ASSUMED DTUM - 100



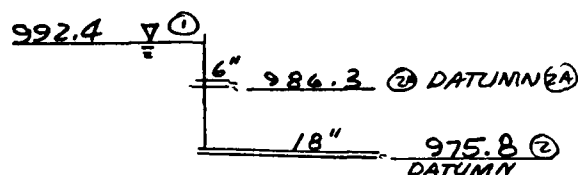
DISCHARGE - 1000 cfs



BY SAL DATE 5/8/80 **ROALD HAESTAD, INC.** SHEET NO. 9 OF 10  
 CONSULTING ENGINEERS  
 CKD BY DLS DATE 5/9/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO. 049-17  
 SUBJECT BURR POND DAM - Blowoff Capacity

Data: 1) Top of dam Elev. = 992.4  
 2) Inv. of blowoff Elev = 975.81  
 3) Inv. of High Level Outlet = 986.3

Head Losses: 1) In the pipe =  $f(L/D) V_2^2/2g$   
 2) Gate Valve =  $K(V_2^2/2g)$  ( $K = 0.25$ )



$$Z_1 + P_1 + \frac{V_1^2}{2g} = Z_2 + P_2 + \frac{V_2^2}{2g} + H_L$$

$$Z_1 = \frac{V_2^2}{2g} + (0.25 + f(\frac{32}{7.5})) \frac{V_2^2}{2g}$$

$$Z_1 = (1 + 0.25 + f(\frac{32}{7.5})) \frac{V_2^2}{2g}$$

Trial & Error Solution

$$Z_1 = 16.6 \text{ ft}$$

$$V_2 (\text{assumed}) = 10 \text{ ft/sec} \rightarrow f = 0.0365 \rightarrow V_2 = 23 \text{ ft/sec}$$

$$= 23 \text{ ft/sec} \rightarrow f = 0.0350 \rightarrow V_2 = 23 \text{ ft/sec}$$

$$\therefore Q_{\text{TOP OF DAM}} = V_2 \times A$$

$$= 23 \text{ ft/sec} (1.77 \text{ ft}^2) = 41 \text{ cfs}$$

6" High Level Outlet:

$$Z_1 + P_1 + \frac{V_1^2}{2g} = Z_2 + P_2 + \frac{V_2^2}{2g} + H_L$$

$$Z_1 = \frac{V_2^2}{2g} + (0.25) \frac{V_2^2}{2g}$$

$$Z_1 = (1 + 0.25) \frac{V_2^2}{2g}$$

Note: friction loss in pipe is neglected because pipe is 5 ft long.

$$6.1 = 1.25 \frac{V_2^2}{2g}$$

$$V_{2A} = 17.7 \text{ ft/sec}$$

$$\therefore Q_{\text{TOP OF DAM}} = V_{2A} \times A$$

$$= 17.7 \text{ ft/sec} \times 0.2 \text{ ft}^2$$

$$= 3.5 \text{ cfs}$$

SUBJECT BURR DAM- Areas

Planimeter Readings:

1) Surface Area : Third = 4.42 sq in 0.91  
ELEV 988 First = 2.62 sq in 0.92  
Start = 1.70 sq in

$$0.91 \text{ in}^2 \times \frac{(2000 \text{ ft})^2}{\text{in}^2} \times \frac{1 \text{ acre}}{43,560 \text{ ft}^2} = 83.6 \text{ use } 84 \text{ acres}$$

2) Watershed: Third = 29.14 sq in 9.33  
First = 10.48 sq in 9.32  
Start = 1.16 sq in

$$9.33 \text{ in}^2 \times \frac{(2000 \text{ ft})^2}{\text{in}^2} \times \frac{1 \text{ sq mi}}{(5280 \text{ ft})^2} = 1.34 \text{ sq mi}$$

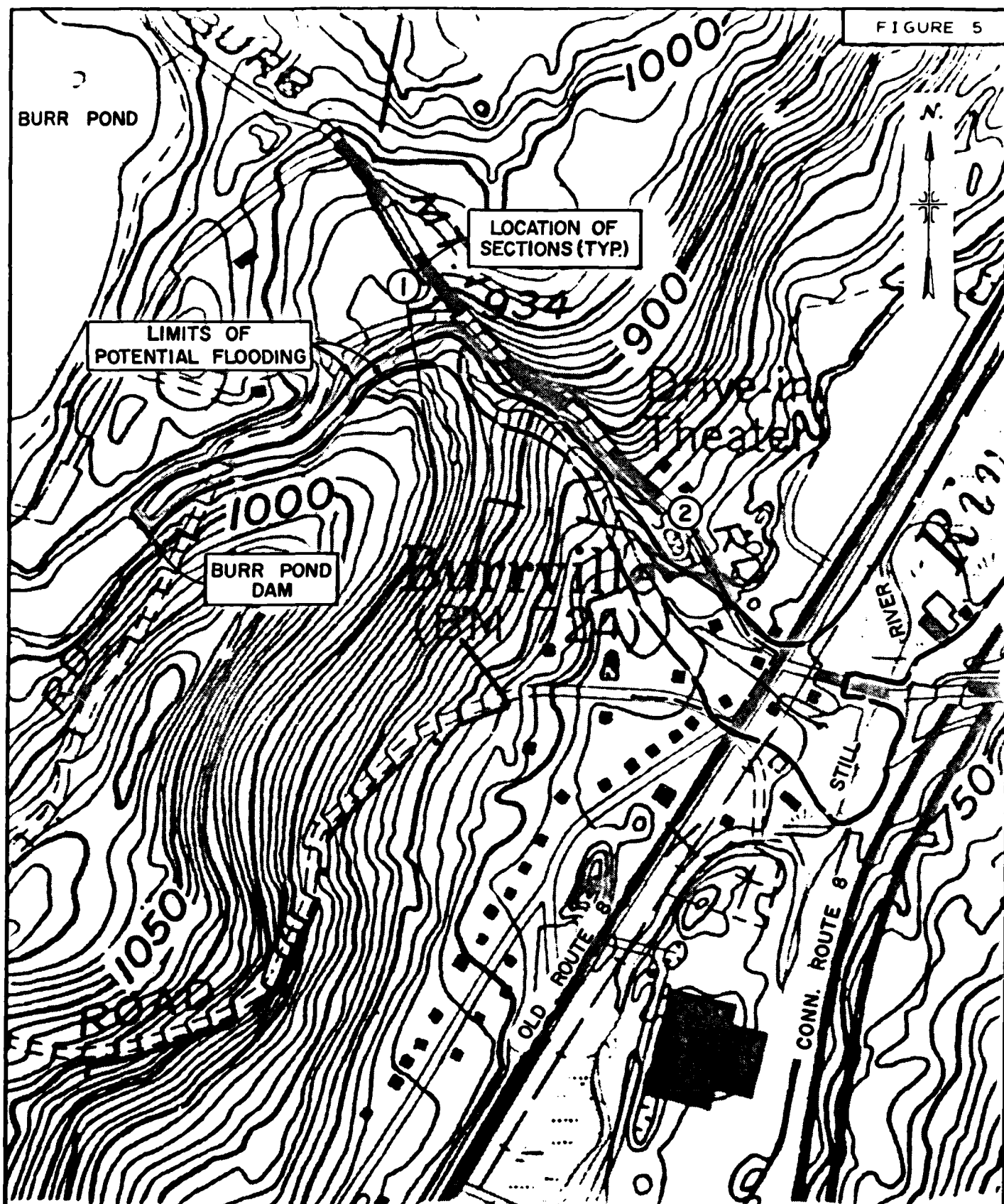
1a) SURFACE AREA ELEV. 990

THIRD 29.96 1.13<sup>in</sup> = 103.8 Acres  
FIRST 27.70 1.12  
START 26.58 USE 104 Acres

16) SURFACE AREA ELEV. 1000

THIRD 34.26 1.44 ✓ = 132.2 Acres  
FIRST 31.37 1.44  
START 29.93 USE 132 Acres

FIGURE 5



LIMITS OF POTENTIAL FLOODING

BURR POND DAM  
TORRINGTON, CONNECTICUT

SCALE: 1" = 500'

ROALD HAESTAD, INC.

TORRINGTON QUADRANGLE 1972

APPENDIX E

INFORMATION AS CONTAINED IN  
THE NATIONAL INVENTORY OF DAMS



# INVENTORY OF DAMS IN THE UNITED STATES

STATE	DIVISION	COUNTY	COUNTY	CONTRACT	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE
CT	94	NE	CT	005	MIDD POND DAM	41 52.1	73 05.4	22 JUNE 60

POPULAR NAME		NAME OF IMPROVEMENT	
MIDD POND		MIDD POND	
REGION	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	POPULATION
11	TH-STILL RIVER	MIDD POND	1

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	IMPOUNDING CAPACITY (ACRES-FT.)
ROCK	1915	0	17	17

REMARKS									
20 ESTIMATE 22 ESTIMATE									
DIC	SPILLWAY	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CU YD)	POWER CAPACITY (KW)	INSTALLED PROPOSED	NO. LENGTH	WIDTH	LENGTH	WIDTH
1	170	11	95	1215	2500				

OWNER	ENGINEERING BY	CONSTRUCTION BY
STATE OF CONNECTICUT		CIVIL CONSERVATION CORPS

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
CT DEP	CT DEP	CT DEP	CT DEP

INSPECTION BY	INSPECTION DATE	INSPECTION AUTHORITY
MAILED HANSTAD INC	DAY MO YR	MAILED HANSTAD INC

REMARKS	

VER/DATE  
N N 20 JUNE 60

END

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